

**SYSTEM AND METHOD FOR ENABLING
REAL TIME UNDERWRITING OF INSURANCE POLICIES**

CROSS-REFERENCE TO RELATED APPLICATIONS

1 This application claims priority from U.S. Provisional Patent Application Serial No.
2 60/246,073, entitled "System And Method For Enabling Real Time Underwriting Of
3 Insurance Policies" and filed November 7, 2000. The disclosure of that provisional
4 application is incorporated herein by reference in its entirety.

BACKGROUND OF THE INVENTION

6 **1. Technical Field**

7 The present invention pertains to a computer system and method for determining,
8 in real time, an individual's eligibility for insurance or other policies. In particular, the
9 present invention pertains to an information collection and assessment tool for use in
10 conjunction with a network, such as the Internet, that allows insurers to assess the
11 eligibility of an applicant and issue a life insurance policy to individuals over the network.

12 **2. Discussion of Related Art**

13 Currently, life insurance companies underwrite policies by conducting long
14 medical interviews with potential customers as well as having a doctor or medical
15 technician, hired by the insurance company, perform a medical examination of a customer
16 and/or conduct a blood and/or urine test. Underwriting is the procedure by which an
17 insurance company assesses the risk to be assumed. In the case of a life insurance
18 company, the risk is the timing of the death of the insured.

19 The above-described underwriting process suffers from several disadvantages. In
20 particular, the process is time consuming while the purchase of an underwritten life
21 insurance policy typically cannot be consummated during a single meeting or via a
22 computer session on a Web site. Further, the process requires the potential customers to
23 interact and deal with unfamiliar medical personnel.

OBJECTS AND SUMMARY OF THE INVENTION

1 Accordingly, it is an object of the present invention to collect and assess
2 information pertaining to the insurability of life insurance applicants via a network.

3 It is another object of the present invention to quantitatively assess individual
4 insurability risk factors and offer a binding life insurance policy to a potential customer via
5 an automated tool.

6 Yet another object of the present invention is to access third party information to
7 determine in real time the insurability of an applicant.

8 Still another object of the present invention is to issue binding life insurance
9 policies to qualified applicants over a network.

10 The aforesaid objects are achieved individually and/or in combination, and it is not
11 intended that the present invention be construed as requiring two or more of the objects to
12 be combined unless expressly required by the claims attached hereto.

13 According to the present invention, a computer system enables an insurance
14 company or other provider to underwrite a life insurance policy (e.g., term, universal, etc.)
15 in real time for potential customers based on relevant insurability information or factors.
16 The insurability information includes medical records and medical claims that are typically
17 maintained and accessed from potential customer healthcare provider (e.g., Health
18 Maintenance Organization, primary care physician, etc.) or other third party databases and
19 other information provided by the potential customers (e.g., age, sex, state of residence,
20 medical and family history, current medical condition, lifestyle, etc.). The computer
21 system retrieves and utilizes this information to produce an underwriting score or value,
22 where information gathered from the potential customer is compared to information within
23 an insurer database. The score is computed based on a formula that takes into
24 consideration the importance of the information in determining mortality risk, and is
25 subsequently used in determining whether or not to underwrite the life insurance policy
26 and the corresponding policy price. The present invention system is preferably utilized
27 with respect to life insurance, but may be employed to underwrite and/or issue all forms of
28 insurance (e.g., homeowners, personal property and automobile insurance, medical
29 insurance, etc.) or other contractual obligations (e.g., loans, financial arrangements, etc.)
30 in substantially the same manner described above.

31 The present invention provides several advantages. For example, if the

1 information available in the medical records and claims is sufficient for the insurer to
2 underwrite the potential customer life insurance policy, the potential customer may obviate
3 the medical examination and/or blood and/or urine tests. Further, if additional medical
4 information is required, the potential customer healthcare provider may conduct an
5 examination or test, thereby reducing costs for the insurer.

6 BRIEF DESCRIPTION OF THE DRAWINGS

7 Fig. 1 is a schematic diagram of a server system employing the insurability
8 assessment tool according to the present invention and accessible by end-users via a
9 communications network.

10 Figs. 2-3 are a procedural flow chart illustrating the manner in which the
11 insurability assessment tool collects insurability information and renders a decision with
12 respect to life insurance policy issuance according to the present invention.

13 Fig. 4 is a procedural flow chart illustrating the manner in which individual
14 insurability factors are assessed to determine an insurability score according to the present
15 invention.

16 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

17 A system employing the assessment tool of the present invention is illustrated in
18 Fig. 1. Specifically, the system preferably includes a server computer system 2 in
19 communication with or connected to a network 4, such as the Internet, end-user computer
20 systems 6 accessing the server via the network and one or more information systems or
21 databases 8 which may be accessed by the server computer system 2 either via network 4
22 or an alternative connection (e.g., direct line, another network, hardwired, etc.). These
23 databases are preferably maintained by third parties (e.g., Health Maintenance
24 Organization (HMO), primary care physician, hospitals, etc.) and contain information
25 relevant to the insurability of a potential customer for life insurance. The information
26 typically includes HMO claims records, medical laboratory test reports and/or
27 computerized results from previous hospital or doctor office examinations. The nature of
28 the particular records stored and accessed may vary widely, depending upon the nature of
29 the insurance or policy desired.

30 The end-user computer systems are typically implemented by conventional

1 personal or other suitable computer systems preferably equipped with display or monitor
2 21, a base 23 (i.e., including the processor memories and internal or external
3 communications devices (e.g., modem, network cards, etc.)), a keyboard 25 and optional
4 mouse 27 or other input device. End-user systems 6 each include software (e.g., operating
5 system, Internet browser, etc.) to communicate with server system 2, and appropriate
6 components (e.g., processor, disk storage or hard drive, etc.) having sufficient processing
7 and storage capabilities to effectively execute the software. The end-user systems may
8 utilize any of the major platforms (e.g., Linux, Macintosh, Unix, OS2, Windows, etc.). An
9 end-user system 6 may be operated directly by a potential customer to access a website
10 hosted on server system 2 to purchase a desired life insurance policy. Alternatively, an
11 end-user system 6 may be manned by an operator that accesses the server website and
12 verbally communicates with a potential customer via a telephone (e.g., the customer may
13 dial a toll free or other telephone number). In addition, an end-user system may be in the
14 form of a voice or telephone keypad driven computer system that accesses the sever and
15 transfers information in response to voice commands or telephone keypad entries (e.g., a
16 potential customer may dial a telephone number to access the end-user system). The server
17 system may alternatively include this type of voice or telephone keypad responsive system
18 and receive calls directly from the potential customer. The alternative end-user systems
19 (e.g., manned and voice or telephone keypad responsive) are particularly suited for
20 customers without network access. The manner in which a potential customer is assessed
21 and a life insurance policy issued is similar for the various end-user systems (e.g.,
22 customer operated, manned and voice or telephone keypad responsive) as described below.

23 Server system 2 is typically implemented by a conventional personal or other
24 suitable computer system preferably equipped with a display or monitor 31, a base 33 (i.e.,
25 including the processor, memories and internal or external communication devices (e.g.,
26 modem, network cards, etc.)), a keyboard 35 and optional mouse 37 or other input device.
27 The server system includes software (e.g., operating system, server software, assessment
28 tool, etc.) to communicate with end-user and information systems 6, 8 and process life
29 insurance policy underwriting and issuance requests, and appropriate components (e.g.,
30 processor, disk storage or hard drive, etc.) having sufficient processing and storage
31 capabilities to effectively execute the assessment tool software. The server system may
32 utilize any of the commercially available operating systems and/or server software, and,

1 under software control, implements the assessment tool of the present invention for
2 processing requests from the end-user computer systems to underwrite and/or issue life
3 insurance and other policies.

4 The manner in which the sever system and assessment tool process life insurance
5 underwriting and issuance requests is illustrated in Fig. 2. Initially, server system 2
6 receives a connection request at step 52 and establishes a session with a requesting end-
7 user computer system 6. A potential customer may utilize any interface to conduct a
8 session (e.g., a World Wide Web (WWW) based website, an automated response
9 telephone system, verbal request via a human operated telephone bank where the operator
10 utilizes an end-user computer system, etc.). In the case of a website interface, the potential
11 customer operates an end-user system and accesses the website to select an option that
12 allows the user to designate and apply for a desired life insurance policy via a web browser
13 interface. Alternatively, the potential customer may call a telephone number associated
14 with an automated response telephone system and conduct a session verbally and/or via a
15 touch tone keypad to apply for the desired policy, or call a telephone number associated
16 with an operator with physical access to an end-user system accessing the server and apply
17 for the desired policy via verbal communication with the operator.

18 The server receives a request for an eligibility assessment at step 54 (e.g., via any
19 of the above-described interfaces) and queries the potential customer for personal
20 identification and contact information (e.g., name, address, telephone number, social
21 security number, prior addresses, etc.) at step 56. This information may be utilized to
22 uniquely identify the potential customer within the system and ensure retrieval of
23 appropriate information for that customer from the databases as described below.

24 The server system subsequently collects information relating to a desired life
25 insurance policy (e.g., policy type, coverage amount, term, etc.) at step 58. Once the
26 policy specifics have been identified, the server system prompts the user for responses to
27 policy specific questions (e.g., age, sex, state of residence, medical and family history
28 (e.g., history of cancer, heart disease, etc.), current medical condition and lifestyle (e.g.,
29 occupation, participation in dangerous recreational activities, use of tobacco or other
30 substances (e.g., drugs, cigars, cigarettes, pipes, etc.), etc.). In particular, the
31 applicant is presented with an eligibility question at step 60 while the response to that
32 question is received by the server system and recorded at step 62. Eligibility questions are

presented to the potential customer until a response has been received with respect to each required eligibility question as determined at step 64. The questions presented to a potential customer may be dynamically tailored by the system for a particular application. For example, if an applicant indicates a history of heart related ailments, additional questions relating to heart disease may be presented.

The server system may further request permission from the potential customer to access customer medical records and claims from an HMO, primary care provider or other organization. This request is optional and depends on various legal and other issues. The medical information may be stored in databases or information systems 8 (e.g., HMO database, primary care databases, etc.) accessible by server system 2. If the server system receives permission or may otherwise validly access customer medical information as determined at step 66, the appropriate medical information for the customer is retrieved from databases 8 at step 68. The database access basically provides the system with sufficient information to facilitate underwriting and issuance of the life insurance policy in real time. The server system determines at step 70 whether or not sufficient information has been obtained from the customer and/or databases to render a decision. When insufficient information is available, the system informs the customer at step 104 that additional information is required to render a decision and saves session information (e.g., policy information, customer information, etc.) at step 124 for later access (e.g., via an account or other identifier) prior to terminating the session. The system may inform the customer of the additional information required and/or may provide contact information for arrangement of tests and/or transfer of additional information to the insurer. Alternatively, the potential customer may enter the additional information to enable the system to render a decision as described below. If sufficient information is received, the server system quantitatively assesses and analyzes the information at step 72 to determine an eligibility score or value with respect to the insurability issues of interest.

The system basically employs an algorithm based on insurer underwriting criteria to evaluate the medical information retrieved from databases 8 and the information provided by the potential customer and produce the underwriting score or value. The manner in which the system determines the score is illustrated in Fig. 4. Specifically, once sufficient information has been received with respect to the insurability issues or factors associated with a selected life insurance policy and corresponding policy options, the

1 system retrieves the recorded responses at step 152 and evaluates the retrieved
2 information. A response associated with an insurability issue is selected at step 154, and a
3 risk assessment value is determined at step 156. The value is assigned to the insurability
4 issue at step 158. This process is repeated until all insurability issues have been assessed
5 and assigned an assessment value as determined at step 160. The underwriting criteria
6 may assign points based on medical test results or other information. By way of example,
7 low blood pressure may be assigned one point, moderate blood pressure may be assigned
8 three points and high blood pressure may be assigned five points. Further, a potential
9 customer may receive points proportional to the level of cholesterol in their blood. The
10 greater the cholesterol level, the greater the number of points the potential customer is
11 assigned and vice versa. The risk assessment values may further be weighted based upon
12 various factors. A total risk factor or eligibility score is calculated by adding the individual
13 assessment values assigned to the potential customer at step 162 after review of the
14 medical and application information. This total score represents a comprehensive
15 quantified assessment of the potential customer insurability, and is used to make decisions
16 on whether or not to underwrite a life insurance policy and to determine the price of the
17 policy as described below. An insurer typically sets a threshold score below which the
18 insurer underwrites a life insurance policy. The number of points below the threshold may
19 be a factor in determining the price of the policy.

20 Referring back to Fig. 3, if the total score determined by the system is below the
21 insurer threshold with respect to the requested policy as determined at step 102, a policy
22 price is calculated based on the score at step 106 and is commensurate with the associated
23 risk. The decision, price and terms of the proposed life insurance policy are presented to
24 the potential customer at step 108. Thus, the system provides an automated underwriting
25 process that accesses appropriate medical and other information from third party databases
26 to render a decision, generally without human intervention by the insurer. If the system
27 determines at step 102 that the total score is equal to or in excess of the insurer threshold,
28 the system informs the potential customer at step 104 that additional information is
29 required to render a decision and saves session information at step 124 prior to terminating
30 the session as described above. The potential customer may be provided with the type of
31 information required and/or contact information to arrange tests and/or transfer of

1 additional information to the insurer. Alternatively, the potential customer may enter the
2 additional information, while the system re-computes the score as described above.

3 When a potential customer score is below the insurer threshold, the cost of the life
4 insurance policy may be reduced by the customer providing additional information. If the
5 system determines at step 110 that the cost of the policy may be reduced by providing
6 additional information (e.g., medical tests or claims, administration of certain medical tests
7 or examinations by customer HMO or primary care provider, etc.), the system informs the
8 potential customer of the nature of the additional information required and provides
9 contact information by which the potential customer may arrange tests and/or transfer of
10 additional information to the insurer. If the customer is to provide additional information
11 as determined at step 112, the system determines at step 113 whether or not the
12 information is to be entered. When the additional information may be entered, the system
13 re-computes the policy price as described above. If the information is not available for
14 entry, the system saves session information at step 124 as described above and terminates
15 the session to enable the customer to obtain the additional information.

16 If the cost of the policy may not be reduced or the customer decides not to provide
17 additional information, the system enables the potential customer to purchase or accept the
18 proposed life insurance policy. If the policy is accepted as determined at step 114, the
19 system receives payment information from the potential customer at step 116. The
20 payment information may be in the form of authorization for credit or debit card deduction
21 or any other arrangement. The system subsequently validates the payment information at
22 step 118. If the system determines that the payment is valid at step 120, the policy is
23 issued at step 122 and is a binding obligation of the insurer according to the terms of the
24 policy, provided that the personal medical information supplied by the potential customer
25 is valid and accurate. If the payment is invalid, the potential customer is provided with
26 the opportunity to accept or reject the proposed policy and to resubmit payment
27 information. When the policy is rejected as determined at step 114, the session is
28 terminated. However, the system may save session information for later access prior to
29 terminating the session as described above.

30 The present invention is basically implemented by a server or other computer
31 system under software control, and enables life insurance or other policies to be issued in
32 real time in a single automated session via access of relevant third party information (e.g.,

1 medical or other information from an HMO or primary care physician, etc.) sufficient to
2 facilitate an acceptable underwriting risk assessment to render a decision.

3 It will be appreciated that the embodiments described above and illustrated in the
4 drawings represent only a few of the many ways of implementing a system and method for
5 enabling real time underwriting of insurance policies.

6 The end-user and server computer systems of the present invention may be
7 implemented by any quantity of any personal or other type of computer system (e.g., IBM-
8 compatible, Apple, Macintosh, laptop, palm pilot, etc.). The computer systems of the
9 present invention may include any commercially available operating system (e.g.,
10 Windows, OS/2, Unix, Linux, etc.). The computer systems of the present invention may
11 further include any commercially available or custom software (e.g., server software,
12 browser software, tool software, etc.), and any types of input devices (e.g., keyboard,
13 mouse, voice recognition, touch screen, etc.). It is to be understood that the software for
14 the computer systems of the present invention may be implemented in any desired
15 computer language and could be developed by one of ordinary skill in the computer arts
16 based on the functional descriptions contained in the specification and flow charts
17 illustrated in the drawings. The computer systems of the present invention may
18 alternatively be implemented by hardware or other processing circuitry. The various
19 functions of the computer systems and databases may be distributed in any manner among
20 any quantity of computers, processing systems and/or software and/or hardware modules.
21 The software and/or algorithms described above and illustrated in the flow charts may be
22 modified in any manner that accomplishes the functions described herein.

23 The network may be implemented by any communications network (e.g., LAN,
24 WAN, Internet, Intranet, etc.). The server and end-user computer systems may include any
25 conventional or other communications devices to communicate over the network. The
26 databases may be implemented by any quantity of conventional or other databases, storage
27 structures (e.g., file, data structure, etc.) or information systems, may be arranged and/or
28 accessed in any fashion (e.g., via any desired keys or identifiers) and may store any desired
29 information (e.g., medical, automotive, financial or credit, etc.) for a particular application.
30 The databases may be local to or resident on the present invention server, and may be
31 maintained and/or refreshed or updated with appropriate information from third parties or
32 any other source at any desired intervals (e.g., hourly, daily, weekly, etc.). Alternatively,

1 the databases may be maintained by third parties (e.g., HMO, primary care physician,
2 hospital, credit agency, motor vehicle agency, etc.) having information associated with a
3 particular application. The databases may be remote from and in communication with the
4 present invention server via any desired communications medium (e.g., modem, network,
5 direct line, etc.). Moreover, the databases may reside on a stand-alone system or any
6 quantity of systems connected via any type of communication medium or network (e.g.,
7 modem, direct line, LAN, WAN, Internet, etc.).

8 The assessment tool may be implemented by any quantity of computer systems,
9 and may reside on the server, end-user or other third-party computer system or any
10 combination of these computer systems. The assessment tool may be available on
11 recorded medium (e.g., floppy diskettes, CD-ROM, memory devices, etc.) for use on
12 stand-alone systems or systems connected by a network, or may be downloaded (e.g., in
13 the form of carrier waves, packets, etc.) to systems from a network. The assessment tool
14 inquiries and resulting information may be displayed and arranged on end-user devices in
15 any fashion. The assessment tool may utilize any display mechanisms to prompt, receive
16 and/or display information to a potential customer (e.g., windows, menus, line prompts,
17 etc.).

18 The present invention is not limited to the applications described herein, but may
19 be used in a manner similar to that described above to assess eligibility on a real-time basis
20 for a multitude of automated policy or other transactions relating to contractual
21 obligations. Information may be entered into the assessment tool via any desired input
22 mechanism (e.g., menu driven windows, voice recognition, telephone keypads, touch
23 screens, stylus pens, or any other device capable of entering information in a manner that
24 may be interpreted by a computer system). Further, the present invention may include
25 voice or telephone keypad responsive systems to enable access by telephone, while end-
26 user systems may be manned by an operator to enable use of the system via telephone calls
27 to the operator. Alternatively, the system may include any interface to accommodate
28 various access devices and mediums (e.g., wireless devices, cellular telephones, pagers,
29 palm pilots, etc.).

30 The potential customer may be uniquely identified to the system by using any
31 suitable identifier having any quantity of any alphanumeric or other characters or symbols.
32 The identifier may be used to access information for that customer from the databases.

1 The system may receive and provide any desired information to identify a desired policy
2 (e.g., type of policy, per event and/or lifetime insured value, nature of payments to the
3 insured, per event fixed or percentage based deductible, annual fixed or percentage based
4 deductible, events and/or conditions covered, etc.).

5 The system may retrieve any desired information from a potential customer and
6 may utilize any quantity of any types of inquiries or questions. The system may
7 dynamically determine and present appropriate questions based on the policy requested
8 and/or responses to prior inquiries. Further, question content may vary where order of
9 presentation to a potential customer may be random, asked in association with a single
10 insurability issue, driven by responses to previous responses, purposefully disjoint, or
11 based upon a combination of the above, so as to solicit pertinent responses from a potential
12 customer. The responses may be of any format, and may be stored in any suitable storage
13 structure (e.g., file, data structure, array, tables, database, etc.) in any desired format or
14 arrangement. The system may further store any desired session information (e.g., policy
15 information, customer information, etc.) in any suitable storage structure (e.g., file, data
16 structure, array, tables, databases, etc.) for later access by the system and/or potential
17 customer via any suitable technique (e.g., log on account, identifier, etc.).

18 The assessment values for the factors may have any desired value (e.g., integer,
19 real, positive, negative, etc.) and be assigned to particular issues in any desired fashion.
20 The assessment values may be weighted in any desired fashion and may be combined in
21 any manner (e.g., multiplied, accumulated, logically combined, percentages, etc.) to
22 achieve a score representing eligibility. The assessment values may be stored in any
23 desired storage structure in any desired fashion (e.g., arrays, look-up or other tables,
24 databases, etc.) and/or may be calculated from received responses and/or information.
25 Each issue may be associated with one or more assessment values where the values may be
26 combined in any fashion to determine a value for that issue. The assessment values may
27 be associated with any desired units (e.g., points, etc.).

28 The system may utilize any quantity of thresholds of any desired value (e.g.,
29 integer, real, positive, negative, etc.) to determine eligibility for a particular application.
30 The thresholds may be a single value or a value range. Eligibility may be based on any
31 desired results of comparisons of the score to the threshold (e.g., greater than, less than,
32 equal to, within or outside a range, etc.). The score may be processed in any fashion for

1 comparison to the threshold (e.g., weighted, multiplied, etc.). Further, the system may
2 utilize thresholds for each individual issue and determine eligibility based on comparisons
3 of each issue score to a threshold or any combination of the individual comparisons. The
4 threshold values may be preset or dynamically generated based on various parameters.

5 The system may determine policy prices in any desired fashion based on the
6 eligibility score and/or other factors (e.g., table look-up, formula or algorithm, etc.). The
7 prices may be stored or calculated by the system, or accessed from a remote system (e.g.,
8 insurer system, database, etc.) having various policy information. The system may
9 determine reductions in pricing in any desired fashion (e.g., score level in relation to a
10 threshold, detecting lack of particular information reducing risk involved, etc.). The
11 system may utilize any quantity of any desired information in order to render a decision,
12 and require any quantity of any information in order to render the decision.

13 The system may display a policy for acceptance in any desired fashion and with any
14 additional information. Further, the policy may be accepted by any type of appropriate
15 user response. The system may display any contractual or other obligations and may verify
16 or confirm acceptance by the potential customer (e.g., an additional display inquiring as to
17 whether the potential customer is sure the customer wants to purchase the policy).

18 The system may accept any desired electronic or other forms of payment (e.g.,
19 credit card, debit card, cash card payments, wired money transfers, etc.). Alternatively, the
20 customer may be billed and remit a check or other form of payment. The payments may be
21 lump sum or prorated based upon a monthly, annual, or other periodic schedule. Further,
22 the payments may be validated in any fashion (e.g., accessing appropriate bank or credit
23 agency information, etc.).

24 The policies may be issued manually or electronically in any desired fashion (e.g.,
25 transmission by dynamic web page, fax, electronic mail, printed and distributed manually
26 via ground mail and/or private couriers, etc.). The system may request the potential
27 customer to acknowledge that the customer has read and agrees to policy terms. The
28 system may display the policy terms, while the acknowledgement may be provided as an
29 electronic acknowledgment at time of issuance, or provided by a subsequent written reply
30 after the policy is issued. Further, the system may generate a receipt (e.g., electronic mail,
31 downloaded file for printing, web page for printing, fax receipt to potential customer, etc.)
32 at time of acceptance or issuance of the policy to confirm the transaction. The receipt may

1 include any desired information (e.g., policy number, confirmation number, etc.).

2 The system preferably handles requests and issues policies in real time. However,
3 the system may alternatively process requests in batch or any other mode. For example, a
4 potential customer may submit a request and the system may contact the potential
5 customer at a later time to offer the policy (e.g., contact the customer via electronic mail or
6 any communications device to render the decision, the system may provide an identifier to
7 enable the customer to access the decision and purchase the policy at a later time, etc.).
8 Alternatively, the system may store and process a series of requests in batch mode.

9 From the foregoing description, it will be appreciated that the invention makes
10 available a novel system and method for enabling real time underwriting of insurance
11 policies, wherein the present invention determines insurability and issues policies in
12 accordance with insurer criteria on a real-time basis as the result of a single automated
13 session.

14 Having described preferred embodiments of a new and improved system and
15 method for enabling real time underwriting of insurance policies, it is believed that other
16 modifications, variations and changes will be suggested to those skilled in the art in view
17 of the teachings set forth herein. It is therefore to be understood that all such variations,
18 modifications and changes are believed to fall within the scope of the present invention as
19 defined by the appended claims.